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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/020,977

12/19/2001

Yukihiro Shibata

520.40997X00

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20457

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03/26/2004

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EXAMINER

STOCK JR, GORDON J

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 03/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/020,977

Applicant(s)

SHIBATA ET AL.

Examiner

Gordon J Stock

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "1" and "41" have both been used to designate a wafer in Fig. 5 (as mentioned on line 2 of first paragraph of page 6). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. The drawings and specification are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 2a of Figs. 2-4 and 7; M2 of Fig. 3; M21 and M11 of Fig. 4; 50 of Fig. 7; 157 and 45 of Fig. 5. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because it exceeds 150 words. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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5. **Claims 1, 8, 10-13, and 15** are rejected under 35 U.S.C. 102(a) as being anticipated by **Fairley et al. (6,288,780)**.

As for **claims 1, 8, 10-13, and 15**, Fairley in a wafer inspection system using advanced optical techniques discloses obtaining an image signal of sample by imaging said sample through an optical system; adjusting optical conditions so as to decrease a contrast difference of a pattern in the image signal among segments corresponding to a plurality of regions; obtaining the image signal under adjusted optical conditions; detecting a defect of said sample by processing image signal; including illuminating sample by polarized light from adjusting polarization conditions that affects contrast (Figs. 12-14; col. 8, lines 10-67; col. 9, lines 1-40; col. 11, lines 5-55; col. 12, lines 20-55; col. 15, lines 1-65; col. 16, lines 10-60) with an apparatus comprising: a stage for loading a sample (Fig. 5, 502); illuminating system comprising brightfield and darkfield (507 and 523 of Fig. 5); an optical control unit which controls a transmission ratio of light illuminated with polarization adjusting unit that affects contrast (col. 18, lines 30-67; Figs. 7, 8, and 14; col. 10, lines 23-35); imaging optical system; imaging detecting unit; a defect detecting section (Figs 2-5); a contrast calculating unit through brightfield imaging (col. 7, lines 23-25; col. 8, lines 40-67; col. 9, lines 1-20) .

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. **Claims 2-7, 9, and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Fairley et al. (6,288,780)** in view of **Yonezawa (6,621,568)**.

As for **claims 2-7, 9, and 14**, Fairley discloses everything as above (see **claims 1 and 11**). In addition, he discloses adjusting angles and the spatial filter characteristics and polarization to decrease contrast by eliminating diffracted light and increasing detected scattered light and difference image processing with multiple images occurs from die to die or cell to cell; sample is illuminated; conditions are determined to increase sensitivity by removing diffracted light from scattered light from defects; settings for transmission of diffracted light are spatial filter characteristics, lighting, and angular placement of optical elements to thereby obtain an image under determined conditions and detecting a defect (col. 8, lines 40-65; col. 9, lines 1-30; col. 11, lines 25-55; col. 12, lines 20-55; col. 13, lines 30-60; col. 14, lines 25-65; col. 16, lines 20-60). Differential imaging is performed through 2 segment thresholding and subtractive imaging (col. 9, lines 1-20; col. 15, lines 5-20).

As for zeroth order diffraction light, Fairley discloses the spatial filter is directly above the sample relatively perpendicular to the optical axis of the brightfield system (Fig. 5) and teaches that alpha diffraction orders are filtered out to maximize scattered signals from defects and minimize diffraction signals from patterned areas of the wafer (Figs. 12 and 13). Yonezawa teaches that the zeroth order will be perpendicular the sample (Fig. 3). Therefore, it would be obvious to one skilled in the art that the zeroth order diffraction order transmission is minimized for this diffraction order propagates perpendicular to the sample and would be a main diffraction component transmitted to the spatial filter which is also perpendicular to the optical axis and

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parallel to the sample surface, and the spatial filter is used to block diffraction orders to maximize scattered signal transmission to the detector.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

U.S. Patent 6,621,570 to Danko

Fax/Telephone Numbers

If the applicant wishes to send a fax dealing with either a proposed amendment or a discussion with a phone interview, then the fax should:

- 1) Contain either a statement "DRAFT" or "PROPOSED AMENDMENT" on the fax cover sheet; and
- 2) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Papers related to the application may be submitted to Group 2800 by Fax transmission. Papers should be faxed to Group 2800 via the PTO Fax machine located in Crystal Plaza 4. The form of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Machine number is: (703) 872-9306

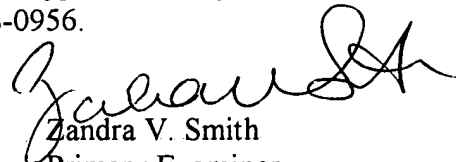
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gordon J. Stock whose telephone number is (571) 272-2431. The examiner can normally be reached on Monday-Friday, 8:00 a.m. - 4:30 p.m.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



gs

March 17, 2004


Zandra V. Smith
Primary Examiner
Art Unit 2877